

Commercial Fishery on Lake Okeechobee, Florida

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LAKE Okeechobee is a fresh water lake of approximately 450,000 surface acres with an average depth of 8.5 feet at elevation 13.5 feet above mean sea level. Maximum depth at normal elevation is about 17 feet. Nearly one-seventh of the lake is littoral zone occupied with a variety of aquatic plants, but predominately *Scirpus*, *Typha*, *Eleocharis*, *Fuirena*, *Eichhorcia crassipes*, *Pistia stratiotes*, *Potamogeton illinoensis*, and *Vallisneria americana*. Bottom substrates vary from marl, sand, shell, muck, and rock. The lake basin is approximately circular. Water control structures are located on all major inlets and outlets to prevent extreme fluctuation of the water level.

Past data indicate that Lake Okeechobee was of great economic importance for commercial fishing and sport fishing. Until 1946 the commercial harvest consisted primarily of catfishes (*Ictalurus* spp.), black crappie (*Pomoxis nigromaculatus*), bluegill (*Lepomis macrochirus*), and shellcracker (*L. microlophus*) and was a substantial influence on the local economy. When Lake Okeechobee came under the jurisdiction of the Florida Game and Fresh Water Fish Commission in 1946 restrictions on both gear and species were induced by organized sportsmen in the belief that reduced or eliminated commercial harvest of the panfishes would increase benefits to sport fishermen.

Much unsubstantiated argument has taken place, both pro and con, on the commercial aspects and their effects on sport fishing. I intend to present factual information concerning the present status of the commercial fishery and to explore ideas on the potential exploitation of the available resources.

GEAR AND SPECIES HARVESTED

Under present regulations of the Florida Game and Fresh Water Fish Commission, legal commercial gear is limited to wire traps, trotlines, and pound nets and haul seines under special permit. Wire traps are limited to a maximum length of seven feet, a maximum diameter of thirty-two inches, a minimum mesh size of one inch and a maximum mesh of one and one-half inches, and a fun-

nel in one end only. Traps may not be fished in less than four feet of water. Each licensee is permitted eighty traps. Trotlines are limited to 1500 hooks during the daylight hours and an unlimited number at night. Maximum length and depth of pound nets is limited to ten feet by twelve feet with a minimum mesh size of two inches stretched. All devices must be adequately marked to identify the licensee.

Wire traps are normally baited with pressed cottonseed and soybean cake broken into five or six inch squares and sandwiched together with large rubber bands. Between one and two pounds of bait is placed in the trap at each fishing, which occurs about every third day. Each trap fisherman normally has about 150 traps and fishes fifty each day, weather permitting.

Trotlines are baited with a variety of material, including shrimp, maggots, grubs, dead minnows, soap, and occasionally hooks are painted and fished without bait. Most trotlines are fished during the night, being set before dark and removed soon after daylight. However, some lines are left in the water at selected locations and fished daily.

Commercial gear is to be used for the taking of non-game fish and turtles. In Lake Okeechobee the commercial harvest consists of channel catfish (*Ictalurus punctatus*), white catfish (*Ictalurus catus*), brown bullheads (*Ictalurus nebulosus*), yellow bullheads (*Ictalurus natalus*), assorted hard-shelled turtles, and soft-shelled turtles (*Trionyx ferox*). The catch of turtles is usually incidental to fishing operations.

COMMERCIAL LICENSES

During the 1967-68 season, approximately 275 commercial fishermen operated under nearly 500 commercial licenses (data obtained from boat registration and license sales records of the Game and Fresh Water Fish Commission), compared to 138 fishermen during the 1952-53 season (Dequine, 1953). The larger number of licenses than fishermen results from the practice of some fishermen purchasing licenses in his relatives' names as well as his own, in order to be entitled to operate additional commercial fishing gear. A retail fish dealer's license is required in order to operate commercial fishing gear and entitles the holder to sell fish and supplies in any manner directly to the consumer or wholesaler. The license fee

is \$5.00 and must be accompanied by the possession of a valid sport fishing license at a cost of \$3.25.

Commercial fishing boats must be registered as such at a cost rate according to the size of the boat.

DISCUSSION

Presently five wholesale fish dealers buy fish taken from Lake Okeechobee. One of these dealers is from another part of the state so that records on the poundages of fish that he purchased are not readily available. The poundages of fish from Lake Okeechobee included here (Table 1) were obtained from fish dealers in the area. During the period from 1 January 1968 to 1 January 1971, a total of 3,005,811 pounds of dressed channel and white catfish from Lake Okeechobee were handled by these wholesale fish dealers. This represents an annual average harvest of 1,001,937 pounds dressed weight. These figures represent an increase over a previous average figure for a ten-year period from 1936 through 1945 (Table 2) of 1,192,647 pounds of catfish rough weight (Dequine, 1951).

The average annual catch of bullheads during the recent period was 45,600 pounds dressed weight. The average annual catch of turtles was 10,248 pounds dressed.

The average annual catch of channel and white catfish represents a value to the commercial fishermen of \$450,871.65 at the average price paid of \$.45 per pound dressed. The bullheads and turtles represent a value of \$19,567.80 for an average annual total value to the some 275 commercial fishermen of \$470,439.45. The total value of the channel and white catfish to the wholesale fish dealers at the average wholesale price is \$651,259.05 as compared to \$241,523.00 for all food fish during the 1952-53 study (Dequine, 1953).

The costs of commercial gear to the fishermen is difficult to determine. Materials for wire traps are about \$3.00 each plus labor. Trotlines cost 3-6 cents per hook depending upon the quality and quantity of the material used. No pound nets or haul seines are in operation at the present. Bait for traps cost 20-30 cents per trap. Bait for trotlines varies in cost depending upon the bait and the individual fishermen. Gasoline for operation of commercial boats is approximately \$2.00 per trip. The cost of boats and motors has not been estimated.

TABLE 1. Monthly harvest (pounds dressed weight) of catfish and turtles

	Month	Channel and White catfish	Bullheads	Turtles
1968	January	66,160	11,165	403
	February	39,953	8,120	491
	March	33,969	5,669	1,686
	April	54,044	2,495	3,319
	May	60,536	1,477	1,557
	June	59,582	1,230	527
	July	103,756	1,267	761
	August	65,537	1,808	1,072
	September	59,311	2,138	1,115
	October	51,441	2,952	792
	November	46,444	3,065	405
	December	77,845	5,045	227
	Total	718,578	46,431	12,355
1969	January	87,184	9,670	230
	February	54,506	3,586	502
	March	54,462	2,288	488
	April	73,317	2,416	719
	May	93,699	2,186	1,389
	June	105,555	1,652	995
	July	85,114	6,068	996
	August	81,742	4,833	960
	September	50,299	3,658	1,523
	October	71,908	2,209	640
	November	70,549	4,047	520
	December	133,006	3,754	133
	Total	961,341	46,367	9,095
1970	January	131,496	2,380	55
	February	115,900	3,198	115
	March	148,258	3,190	679
	April	163,431	1,384	1,000
	May	108,170	2,040	673
	June	126,261	2,084	1,227
	July	93,406	2,700	976
	August	81,201	6,452	1,517
	September	67,798	5,675	1,144
	October	83,569	4,674	1,023
	November	86,326	6,106	381
	December	120,076	4,300	506
	Total	1,325,892	44,183	9,296
Grand total		3,005,811	136,981	30,746
Monthly average		83,495	3,805	854
Annual average		1,001,937	45,660	10,248
Lbs./acre/year		2.2	0.1	0.02

TABLE 2

Total catch (pounds rough weight) of bream, catfish, and crappie reported from Lake Okeechobee 1936 through 1945 (Dequine, 1951).

Year	Bream	Catfish	Crappie
1936	258,900	1,714,100	302,100
1937	541,800	932,400	343,700
1938	540,100	1,074,900	434,700
1939	540,800	1,180,600	721,000
1940	396,800	1,529,900	605,800
1941	121,628	1,551,924	784,351
1942	103,492	446,385	91,074
1943	682,717	919,469	359,613
1944	607,281	1,143,626	292,123
1945	494,991	1,433,168	287,913
Total	4,288,509	11,926,472	4,222,374
Average	428,851	1,192,647	422,237
Average lbs. per acre	0.95	2.65	0.94

Figures from 1936 through 1940 were obtained from "Fishery Industries of the U.S." published by the U.S. Department of Commerce and Interior; those from 1941 through 1945 were obtained from annual bulletins entitled "Recapitulation of Fish Census" issued by the Florida Board of Conservation.

PROJECTION

The harvest of channel and white catfish during the three year period from 1 January 1968 to 1 January 1971 represents a catch of about 2.2 pounds dressed per surface acre of water per year. Over a year's time this figure is below the potential natural production as indicated by an annual removal of 61.71 pounds per acre rough weight of catfishes from Lake George (Table 3) over a ten year period (Dequine, 1951). One may assume that Lake Okeechobee has a greater potential primary productivity per unit area now than formerly because of the increased harvest so that potential production of fish is greater. This results from more intensive agricultural practices, the increased population of the area together with canal construction and levee confinement of the lake and tributaries affecting the nutrient content of the water. Because of the tremendous sport fishery on Lake Okeechobee, however, commercial restrictions are so stringent as to prevent the harvest of any game fish and thus limit the harvest of catfish. The harvest of catfish from Lake Okeechobee does represent a significant portion of the econ-

TABLE 3

Total catch (pounds rough weight) of bream, catfish, and crappie reported from Lake George 1936 through 1945 (Dequine, 1951).

Year	Bream	Catfish	Crappie
1936	382,900	2,320,000	146,100
1937	249,300	3,087,700	146,600
1938	506,500	2,569,200	114,100
1939	81,500	—	401,100
1940	—	—	136,100
1941	425,790	2,561,562	129,271
1942	626,983	2,797,681	166,841
1943	583,552	3,356,977	367,747
1944	780,684	2,868,075	261,119
1945	885,298	3,672,136	389,340
Total	4,522,507	23,233,431	2,258,318
Average	502,501	2,904,178	225,831
Average lbs. per acre	10.67	61.71	4.79

Figures from 1936 through 1940 were obtained from "Fishery Industries of the U.S." published by the U.S. Department of Commerce and Interior; those from 1941 through 1945 were obtained from annual bulletins entitled "Recapitulation of Fish Census" issued by the Florida State Board of Conservation.

Figures for catfish for 1939 and 1940 were available only for the eastern "district" of Florida and could not be broken down into the area concerned.

Figures for bream for 1940 in question.

omy of the five surrounding counties and to those individuals who rely in whole or in part on commercial fishing for their livelihood.

During the two-year study by the Florida Game and Fresh Water Fish Commission from 1948 to 1950 (Dequine, 1951), there was no evidence that the harvest of catfishes had either beneficial or detrimental effects on the composition of game, commercial, or rough fishes. The past data demonstrated that the harvest of fish by the methods employed did not reduce numbers of the species from year to year because of the relatively small percentage of younger fish taken in the operations. This assured the following year's crop. During the study from 1952 to 1953 in which bream and crappie were included as commercial species, no indications of decreased yield of desired species of fish to either sport or commercial fishermen were evident other than those of a seasonal nature (Dequine, 1953). The natural potential production of bream

TABLE 4

Estimated potential annual harvest of bream, catfish, and crappie from Lake Okeechobee based on sustained annual harvest from Lake George with respective monetary values.

	Bream	Catfish	Crappie
Surface acres	450,000	450,000	450,000
Estimated Potential			
Annual Harvest/Acre	10 lbs.	61 lbs.	5 lbs.
Total Harvest	4,500,000	27,450,000	2,250,000
Average Market			
Price/Pound	\$.25	\$.45	\$.25
Estimated Potential			
Annual Value	\$1,125,000	\$12,352,500	\$562,500
Grand Total	\$14,040,000		

Prices quoted are those paid to the commercial fishermen by the wholesale fish dealers or illegal fish buyers.

and crappie (Table 3) is evidenced by the commercial removal of 10.67 and 4.79 pounds per acre, respectively, over a ten-year period from Lake George (Dequine, 1951) without any measurable detriment to the sport fishery resource.

In order to more fully utilize the fishery resources available in Lake Okeechobee, a more intensive commercial harvest program must be applied. In addition, harvest of all species of fish must be accomplished which necessitates creation of a demand for presently undesirable rough fish. An expansion of the commercial fishery would provide a direct economic benefit to the fishermen in excess of \$14,000,000.00 per year based on potential harvest information and present market prices (Table 4). To accomplish this objective, commercial gear other than that allowed must be permitted. To provide for supervision of the expanded industry, legislative action must occur to establish a tax based on poundages harvested in order that the industry is regulated by monies of its own creation.

SUMMARY

Commercial fishing gear permitted on Lake Okeechobee consists of wire traps, trotlines, and pound nets and haul seines under special permit. Channel catfish, white catfish, brown bullheads, yellow bullheads, and turtles comprise the commercial harvest. Approximately 275 commercial fishermen took 3,005,811 pounds of

channel and white catfish dressed weight during the period 1 January 1968 through 1 January 1971; 136,981 pounds dressed of bullheads, and 30,746 pounds dressed of turtles representing a direct income to the fishermen of \$1,411,318.35. The harvest represents a catch of 2.2 pounds of channel and white catfish per surface acre per year which is about 5 per cent of the potential harvest. Restrictions on fishing gear to prevent harvest of bream and crappie as well as bass restrict the harvest of the present commercial species. Previous studies by the Florida Game and Fresh Water Fish Commission determined that the commercial harvest of crappie, bream, and catfishes would have neither detrimental nor beneficial effects on sport or commercial fishing. To utilize more fully the fishery resource of Lake Okeechobee, the commercial harvest of virtually all species of fish must occur with commercial gear other than that presently allowed. With a commercial harvest approaching known potential production, the result would be an increase to the local economy in excess of \$14,000,000.00 annually and through legislative action could provide monies for supervision and regulation of the industry.

LITERATURE CITED

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